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ABSTRACT

A study was conducted at Piedmont Virginia Community College (PVCC) to examine occupational/technical programs with respect to student enrollment, program completion, and occupational opportunities for graduates. Study findings included the following: (1) during any particular academic term, occupational/technical students constituted approximately one-third of all curricular students and full-time equivalents at PVCC; however, they made up nearly two-thirds of all PVCC graduates; (2) in 1988, nearly one-third of the occupational/technical students were enrolled in the Business and Management program, with the next largest programs being Nursing and Computer Information Systems; (3) five of the college's nine Associate in Applied Science degree programs fulfilled the state standard of at least seven graduates per year, with the Nursing program producing an average of 41 per year; and (4) generally, the growth rates and job opportunities in occupations for which PVCC provides occupational/technical training were quite high, though the Respiratory Therapy program appeared to graduate more students than there were available jobs. Based on study findings, recommendations were developed for improving data gathering, assessing community needs, and re-examining the academic review process. (AYC)

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OCCUPATIONAL/TECHNICAL PROGRAMS AT PIEDMONT VIRGINIA COMMUNITY COLLEGE

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PVCC Institutional Research Brief

Brief No. 89-3

April 1989

OCCUPATIONAL/TECHNICAL PROGRAMS AT PVCC

This brief highlights the findings in *Occupational/Technical Programs at Piedmont Virginia Community College* (PVCC Institutional Research Report No. 3-89, April 1989), a study designed to examine occupational/technical programs at Piedmont Virginia Community College (PVCC) with respect to student enrollment, student completion, and occupational opportunities for graduates. The study is intended to supplement the academic review process, as currently conducted by the Office of the Dean of Instruction, and is to be used in conjunction with the annual graduate survey reports and employer survey reports published by the Office of Institutional Research and Planning.

Occupational/technical students typically constitute approximately one-third of all curricular students and FTES enrolled at PVCC.[1] Of these occupational/technical students, nearly one-third are enrolled in the Business and Management program. The next largest programs in terms of student enrollment are Nursing and Computer Information Systems. The two smallest programs are Arts and Crafts Production and Science Laboratory Technology. In terms of student completion, however, approximately two-thirds of all graduates receive degrees in occupational/technical areas. Occupational/technical students, in other words, are much more likely to complete their degrees or award programs than are college transfer students.

Measuring Associate of Applied Science (AAS) programs over a three-year average period against SCHEV productivity standards, two programs, Drafting and Design and Science Laboratory Technology, met neither FTES enrollment nor graduation standards; one program, Respiratory Therapy, met graduation standards but not FTES enrollment standards; and two programs, Office Systems Technology and Police Science, met FTES enrollment standards but not graduation standards.[2]

Generally, the growth rates for occupations for which PVCC occupational/technical programs prepare workers are quite high. The only exception to this is the

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[1] One FTES, or full-time equivalent student, is generated for every 15 student credit hours.

[2] "Productivity standards required that programs have an average of . . 7 or more A.A.S. degrees . . The requirement for FTE majors is 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Eighteen FTES, then, are needed for each AAS program to meet the SCHEV requirement (2.5 times 7 graduates). Please note that the AAS program in Business and Management has three majors: Accounting, Management, and Marketing. Although these are referred to as majors in the college *Catalog*, they are really areas of specialization and not college majors.

(Continued on reverse side)

Mechanical Technology program, but occupational growth rates do not take into account the rise of CAD systems. Similarly, there seem to be ample job opportunities in occupations for which PVCC occupational/technical programs prepare workers. The only exception is the Respiratory Therapy program in which there appears to be more graduates than jobs.

Three recommendations emerged from *Occupational/Technical Programs at Piedmont Virginia Community College*. First, efforts must be intensified to ensure that students are correctly coded in the VCCS database with respect to the curriculum in which they are enrolled. Already steps have been taken by the Office of Admissions and Records (A&R) to ensure that correct curricular codes are entered during registration and throughout an academic term. Not only should the procedures adopted by A&R to accomplish this be evaluated periodically, but A&R should attempt to correct the curricular codes of students already in the student database.

It is unfair to expect A&R to update all student curricular codes without the assistance of the administration and faculty. It is recommended that one academic administrator or faculty member from each degree or certificate program review each semester a list of all students within that program and send additions, deletions, or corrections to A&R. The list itself can be generated from the Office of Administrative Computing.

A second recommendation is that a community needs assessment be conducted in the near future. A thorough community needs assessment has not been conducted at PVCC in the 1980's, and it is difficult to know whether in fact the college is meeting all of the needs of its service region. A community needs survey would help resolve some of the questions raised in *Occupational/Technical Programs at Piedmont Virginia Community College*. For example, a community needs survey would indicate whether in fact there are more PVCC graduates than jobs in Respiratory Therapy. It would also indicate whether the demand for CAD trained drafters will be high within the PVCC service region.

Although the Office of Institutional Research and Planning should play a major role in a community needs assessment, the task should include as many groups and members of the college community as possible. At least one academic administrator or faculty member from each degree or certificate program should be designated to collect data concerning that program.

The final recommendation is that the entire academic program review process be re-examined. Although the process has resulted in a great deal of valuable information, it has not provided other information that may be crucial in making sound decisions. Part of the problem is that the review process concentrates on single programs rather than the entire curriculum. For instance, by concentrating only on single programs, the review process has neglected the problem of coding students in curricula no longer offered at PVCC. A more systematic academic program review process is probably needed.

TABLE OF CONTENTS

INTRODUCTION 1

STUDENT ENROLLMENT IN OCCUPATIONAL/TECHNICAL PROGRAMS 6

STUDENT COMPLETION OF OCCUPATIONAL/TECHNICAL PROGRAMS 10

OCCUPATIONAL GROWTH AND DEMAND 14

CONCLUSIONS 19

RECOMMENDATIONS 21

LIST OF TABLES

TABLE 1: NUMBER OF PVCC FALL TERM STUDENTS BY OCCUPATIONAL/TECHNICAL PROGRAM 7

TABLE 2: NUMBER OF PVCC FTES BY OCCUPATIONAL/TECHNICAL PROGRAM 9

TABLE 3: NUMBER OF PVCC GRADUATES BY OCCUPATIONAL/TECHNICAL PROGRAM 12

TABLE 4: OCCUPATIONAL GROWTH BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM (1988-1989) 15

TABLE 5: OCCUPATIONAL DEMAND BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM (1988-1989) 17

TABLE 6: OCCUPATIONAL DEMAND FOR PVCC OCCUPATIONAL/TECHNICAL PROGRAM GRADUATES AND STUDENTS (1988-1989) 18

LIST OF FIGURES

FIGURE 1: PVCC CURRICULAR STUDENTS BY FALL PROGRAM ENROLLMENT AND BY TYPE OF DEGREE RECEIVED 11

OCCUPATIONAL/TECHNICAL PROGRAMS AT PIEDMONT VIRGINIA COMMUNITY COLLEGE

INTRODUCTION

One of the primary missions of Piedmont Virginia Community College (PVCC) is to provide occupational/technical education for citizens within its service region. As defined in PVCC's mission statement,

> Occupational and technical education programs are designed to meet the increasing demand for technicians, semiprofessional workers, and skilled craftsmen for employment in industry, business, the professions, and government. The curricula are planned primarily to provide workers for the region served by the college.[1]

Occupational/technical programs lead to an Associate of Applied Science (AAS) degree, a certificate, or a career studies certificate. Additionally, in the past, PVCC has offered occupational/technical programs leading toward diplomas. Currently, the college offers nine AAS programs, three certificate programs, and nine career studies certificate programs.

The nine AAS programs are Business and Management (with majors in Accounting, Management, Banking and Finance, and Marketing/Real Estate), Business and Office/Secretarial Science, Computer Information Systems (with majors in Computer Programming and Microcomputers for Business), Electrical/Electronics Technology,

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[1]*Piedmont Virginia Community College 1988-1990 Catalog*, p. 4.

Mechanical Technology/Drafting and Design, Protective Services/Police Science, and Science Laboratory Technology. The three certificate programs are Administration of Justice, Arts and Crafts Production, and Business and Office. The nine career studies certificate programs are Business and Management, Business and Office, Child Care, Computer-Aided Drafting, Data Processing, Electronics Technology, General Education, Health Technology, and Industrial Mechanics.

All instructional programs at PVCC, including occupational/technical programs, are subjected to academic program review every three years. Academic program review is conducted through the Office of the Dean of Instruction and includes analyses of enrollment trends, graduation and graduate data, program costs, employer satisfaction, and job opportunities. The results of academic program review, however, are not widely shared, and little effort has been made to formally and systematically combine the results into one source.

The purpose of this study is to supplement the academic review process by examining PVCC's occupational/technical programs with respect to enrollment, completion, and occupational opportunities. Key trends in both the occupational/technical programs themselves and the professions in which program graduates are employed are identified, and an attempt is made to apply various criteria by which the programs can be measured. When combined with the annual graduate survey reports and employer survey reports, this study provides a fairly detailed examination of occupational/technical programs and student outcomes.

Three major sources of data were used in conducting the study. Student enrollment data were collected from the VCCS Student Enrollment Booklets published electronically each term by the VCCS. Student graduation data were collected from the VCCS Graduation Awards Conferred Booklets published electronically each year by the VCCS. Occupational data were collected from the seventh edition of *Virginia Occupational Demand, Supply and Wage Information*, hereafter referred to as *VODSWI.*[2]

Although this study provides a great deal of useful information for both academic administrators and teaching faculty in the occupational/technical areas, some of the limitations of the study should be noted.

First, and most importantly, the study is not meant to be a rigorous and authoritative evaluation of technical/occupational programs. Rather, the various evaluation criteria used in the study are intended to generate discussion of the strengths and weaknesses of the programs.

Second, although student enrollment and graduation data are authoritative in the sense that they are the sources used by the VCCS to monitor academic programs, student enrollment, and student program completion, in some cases they are neither valid nor reliable. For instance, PVCC has not offered a diploma in Drafting Design since the early 1980's, yet during the last three years, approximately six students each fall have been classified as enrolled in the diploma program for Drafting Design. In all

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[2]Julia H. Martin *et al.*, *Virginia Occupational Demand, Supply and Wage Information, Service Delivery Area 7*, 7th edition (Charlottesville: Virginia Occupational Information Coordinating Committee, Center for Public Service, December 1988).

cases, these are students who should have been classified in either the certificate program in Drafting or the career studies certificate program in Drafting. The certificate program in Drafting is not currently offered by the college, yet during Fall Semester 1988 two students were classified as enrolled in the program. The same problem has occurred with respect to certificate programs in Electronics Servicing and Health Technology, neither of which is currently offered at the college.

In another instance, only ten students were enrolled in Respiratory Therapy during Fall Semester 1988. Actually, an additional six to eight students should have been enrolled in Respiratory Therapy but had been incorrectly classified as enrolled in other programs of study.

In still another instance, the numbers of 1987-1988 graduates of several occupational/technical programs listed in the commencement program differed from the numbers shown in the VCCS student database. In this particular instance, the numbers listed in the commencement program included students who were expected to graduate but did not. There have been instances, however, of errors occurring when reporting graduates to the VCCS.

The several instances of incorrect program classification are perhaps the most disturbing feature of this study. The author strongly recommends that efforts be intensified to ensure not only that students are correctly classified upon entry into a curricular program but that their classification is monitored on a regular basis. Without regular monitoring, a change from one curriculum to another will not be reflected in the

VCCS student database, and in a worst case scenario, the State Council for Higher Education in Virginia (SCHEV) might recommend that a program be discontinued based upon erroneous data. The monitoring procedures used by the Office of Admissions and Records (A&R) should be evaluated periodically, and data reported by A&R should be reviewed by academic administrators and faculty to ensure accuracy.

Another limitation of the study is that data for the career studies certificate are reported in aggregate form only and not by the nine different program areas. In this respect, it was impossible to compare enrollment and graduate data with occupational growth and job openings. It should be noted in this regard that internal codes have been developed for each career studies certificate program. Using these codes in computer programs written at the college, some information on each career studies certificate program can be retrieved from the VCCS student database.

Still another limitation of the study is that occupational information is reported for Service Delivery Area 7 (SDA 7), which closely but not exclusively approximates PVCC's service region. The PVCC service region consists of the counties of Albemarle, Fluvanna, Greene, Louisa, and Nelson, the northern half of Buckingham County, and the city of Charlottesville. SDA 7 consists of the counties of Albemarle, Culpeper, Fauquier, Fluvanna, Greene, Louisa, Madison, Nelson, Orange, and Rappahannock, and the city of Charlottesville.

Finally, occupational data do not in all cases match program data as precisely as might be desired. For instance, while it is easy to relate the major in Accounting in the

Business and Management program to the *VODSWI* category of *Accountant/Auditor*, it is less easy to relate the certificate program in Arts and Crafts to *VODSWI* categories. Although the Arts and Crafts program is not really designed to produce primarily commercial artists, designers, photographers, or cabinetmakers, these were the most relevant *VODSWI* categories. There are no *VODSWI* categories for "self-employed craftsman, craftsman/designer, model maker, crafts supplier, cottage industry manager, crafts photographer, craftsman for craft shop, historical craftsman, professional artist, art therapist, [or] teacher aide in arts," the occupational objectives listed for Arts and Crafts in the *PVCC Catalog*.[3]

STUDENT ENROLLMENT IN OCCUPATIONAL/TECHNICAL PROGRAMS

During any particular academic term, slightly more than one-third of all curricular students are enrolled in occupational/technical programs.[4] In terms of the number of students enrolled, programs and majors range from 1 or 2 to more than 200. The number of fall term students enrolled in occupational/technical programs during the past three years is presented in Table 1. As can be seen, nearly one-third of all occupational/technical students were enrolled in the Business and Management program. The

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[3]PVCC *1988-1990 Catalog*, p. 42.

[4]The other two-thirds are enrolled in college transfer programs. College transfer programs are those leading to the Associate in Arts (AA) degree or Associate in Science (AS) degree. The purpose of these programs is "to prepare students for transfer to four-year baccalaureate programs" (PVCC *1988-1990 Catalog*, p. 32).

next largest programs in terms of student enrollment were Nursing and Computer Information Systems. The two smallest programs were Arts and Crafts Production and Science Laboratory Technology.

TABLE 1: NUMBER OF PVCC FALL TERM STUDENTS BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	Fall 1986 No.	Fall 1986 Pct.	Fall 1987 No.	Fall 1987 Pct.	Fall 1988 No.	Fall 1988 Pct.	AVERAGE No.	AVERAGE Pct.
Arts & Crafts (Cert.)	7	1.0%	5	0.7%	2	0.3%	5	0.6%
BUSINESS & MANAGEMENT								
Accounting (AAS)	55	7.9%	56	7.3%	72	9.1%	61	8.1%
Management (AAS)	161	23.0%	171	22.4%	163	20.6%	165	21.9%
Marketing (AAS)	9	1.3%	21	2.7%	41	5.2%	24	3.1%
BUSINESS & OFFICE								
Office Systems (AAS)	49	7.0%	43	5.6%	42	5.3%	45	5.9%
Clerical Studies (Cert.)	2	0.3%	1	0.1%	2	0.3%	2	0.2%
Computer Systems (AAS)	106	15.2%	109	14.3%	118	14.9%	111	14.7%
ELECTRONICS								
Electronics (AAS)	53	7.6%	62	8.1%	61	7.7%	59	7.8%
Electronics (Cert.)	5	0.7%	8	1.0%	4	0.5%	6	0.8%
Health Technology (Cert.)	8	1.1%	5	0.7%	2	0.3%	5	0.7%
MECHANICAL TECHNOLOGY								
Drafting & Design (AAS)	10	1.4%	28	3.7%	27	3.4%	22	2.9%
Drafting (Cert.)	8	1.1%	6	0.8%	4	0.5%	6	0.8%
Drafting Design (Diploma)	11	1.6%	9	1.2%	5	0.6%	8	1.1%
Nursing (AAS)	108	15.5%	129	16.9%	140	17.7%	126	16.7%
POLICE SCIENCE								
Police Science (AAS)	38	5.4%	46	6.0%	45	5.7%	43	5.7%
Law Enforcement (Cert.)	4	0.6%	2	0.3%	4	0.5%	3	0.4%
Respiratory Therapy (AAS)	18	2.6%	16	2.1%	10	1.3%	15	1.9%
Science Laboratory (AAS)	--	--	8	1.0%	4	0.5%	6	0.8%
CAREER STUDIES CERTIFICATE	47	6.7%	39	5.1%	44	5.6%	43	5.8%
TOTAL	699	37.7%	764	35.4%	790	35.0%	753	36.0%

SOURCE: VCCS Student Enrollment Booklet, Table 6C. Percentages are by column except for the final row which is the percentage of occupational/technical students among all curricular students.

It should be noted that the figures in Table 1 refer to the number of students who were officially classified as majors in the various programs. The figures do not refer to the number of students taking classes in the various program areas. This is an important distinction to bear in mind. For instance, during Fall Semester 1988, only five students were enrolled in the

Arts and Crafts program yet 356 students took classes in Arts and Crafts.

Another way to review academic program enrollment is to examine the number of FTES reported for each program. One FTES, or full-time equivalent student, is generated for every 15 student credit hours. FTES enrollment is important for two reasons. First, institutional funding is based upon the number of annualized FTES. Secondly, one measure of academic program productivity used by SCHEV is to calculate the number of FTES enrolled in each associate degree program. According to SCHEV guidelines, an average of 18 FTES should be enrolled in an AAS program each year.[5]

Table 2 presents the number of fall term FTES enrolled in each occupational/technical program at PVCC during the past three years and indicates whether the AAS programs met the SCHEV standard. It should be noted that the FTES figures in Table 2 are generated from the credit hours of students officially classified as occupational/technical students and not from the credit hours of students taking classes in the occupational/technical areas. The distinction is important. For instance, the FTES generated by students taking classes in Arts and Crafts during Fall Semester 1988 was 77, yet the FTES generated by students officially enrolled in Arts and Crafts was only one.

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[5]"Productivity standards required that programs have an average of . . . 7 or more A.A.S. degrees . . . The requirement for FTE majors is 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Eighteen FTES, then, are needed for each AAS program to meet the SCHEV requirement (2.5 times 7 graduates). Please note that the AAS program in Business and Management has three majors: Accounting, Management, and Marketing. Although these are referred to as majors in the college *Catalog*, they are really areas of specialization and not college majors.

TABLE 2: NUMBER OF PVCC FTES BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	Fall 1986 No.	Fall 1986 Pct.	Fall 1986 Meets SCHEV Standard	Fall 1987 No.	Fall 1987 Pct.	Fall 1987 Meets SCHEV Standard	Fall 1988 No.	Fall 1988 Pct.	Fall 1988 Meets SCHEV Standard	AVERAGE No.	AVERAGE Pct.	AVERAGE Meets SCHEV Standard
Arts & Crafts (Cert.)	4	1.1%	N/A	3	0.8%	N/A	1	0.3%	N/A	3	0.7%	N/A
BUSINESS & MANAGEMENT			Yes			Yes			Yes			Yes
Accounting (AAS)	26	6.9%		27	6.8%		34	9.0%		29	7.5%	
Management (AAS)	70	18.6%		73	18.4%		66	17.4%		70	18.1%	
Marketing (AAS)	4	1.1%		14	3.5%		21	5.5%		13	3.4%	
BUSINESS & OFFICE												
Office Systems (AAS)	23	6.1%	Yes	22	5.6%	Yes	24	6.3%	Yes	23	6.0%	Yes
Clerical Studies (Cert.)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Computer Systems (AAS)	45	11.9%	Yes	48	12.1%	Yes	52	13.7%	Yes	48	12.5%	Yes
ELECTRONICS												
Electronics (AAS)	30	8.0%	Yes	36	9.1%	Yes	29	7.7%	Yes	32	8.2%	Yes
Electronics (Cert.)	2	0.5%		3	0.8%		2	0.5%		2	0.6%	
Health Technology (Cert.)	4	1.1%	N/A	2	0.5%	N/A	1	0.3%	N/A	2	0.6%	N/A
MECHANICAL TECHNOLOGY												
Drafting & Design (AAS)	7	1.9%	No	21	5.3%	Yes	16	4.2%	No	15	3.8%	No
Drafting (Cert.)	3	0.8%		2	0.5%		2	0.5%		2	0.6%	
Drafting Design (Diploma)	5	1.3%		3	0.8%		2	0.5%		3	0.9%	
Nursing (AAS)	59	15.6%	Yes	74	18.7%	Yes	82	21.6%	Yes	72	18.6%	Yes
POLICE SCIENCE												
Police Science (AAS)	25	6.6%	Yes	30	7.6%	Yes	24	6.3%	Yes	26	6.8%	Yes
Law Enforcement (Cert.)	1	0.3%		1	0.3%		1	0.3%		1	0.3%	
Respiratory Therapy (AAS)	18	4.8%	Yes	14	3.5%	No	9	2.4%	No	14	3.5%	No
Science Laboratory (AAS)	--	--	--	5	1.3%	No	2	0.5%	No	4	0.9%	No
CAREER STUDIES CERTIFICATE	51	13.5%	N/A	18	4.5%	N/A	11	2.9%	N/A	27	6.9%	N/A
TOTAL	377	36.6%		396	32.6%		379	30.3%		385	33.1%	

SOURCE: VCCS Student Enrollment Booklet, Table 160. Percentages are by column except for the final row which is the percentage of occupational/technical FTES among all FTES. SCHEV productivity standards "require that programs have an average of . . . 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Each AAS program, then, requires 18 FTES (7 graduates times 2.5). SCHEV does not set productivity standards for certificates or diplomas.

As can be seen, the 1985-1988 three-year average number of FTES enrolled in occupational/technical programs ranged from 0 for the certificate program in Clerical Studies to 112 for the AAS program in Business and Management. Occupational/technical program FTES accounted for approximately one-third of all curricular FTES. This was a slightly lower figure than that for headcount, indicating that college transfer students normally carry a slightly heavier course load than occupational/technical students.

Examining only the nine AAS programs, six met SCHEV productivity standards during each of the past three years. These six were Business and Management, Business and Office, Computer Information Systems, Electronics, Nursing, and Police Science. The AAS program in Respiratory Therapy met the standard during fall 1986, but since that time FTES enrollment has decreased, and in terms of SCHEV standards, it was non-productive. The AAS program in Drafting and Design did not meet the SCHEV standard during either fall 1986 or fall 1988 but did meet it during fall 1987. The AAS program in Science Laboratory Technology has never met the SCHEV standard.

STUDENT COMPLETION OF OCCUPATIONAL/TECHNICAL PROGRAMS

Although only about one-third of all curricular students are enrolled in occupational/technical programs, roughly two-thirds of all PVCC graduates receive degrees in occupational/technical programs (AAS, certificates, and career studies certificates). For

instance, as can be seen in Figure 1, while 35.37% of all curricular students during Fall Quarter 1987 were enrolled in occupational/technical programs, 61.47% of all graduates during the 1987-1988 academic year were occupational/technical graduates.

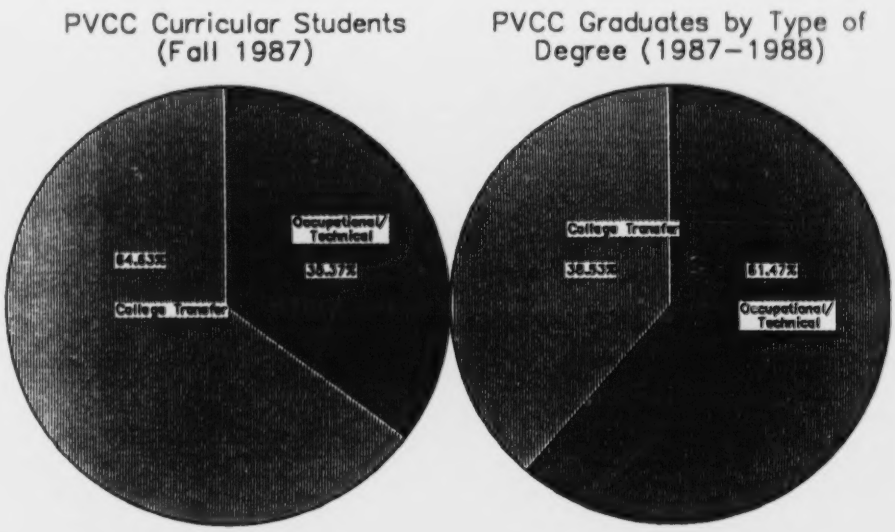

FIGURE 1: PVCC CURRICULAR STUDENTS BY FALL PROGRAM ENROLLMENT AND BY TYPE OF DEGREE RECEIVED

In other words, occupational/technical students are much more likely to complete their programs than are college transfer students. The reason for this may be that the goal of college transfer students is to transfer to a four-year, baccalaureate-granting institution and not necessarily to receive an associate degree at PVCC. Many of these students, in fact, do transfer to four-year colleges or universities before completing their PVCC degree requirements. Still, it is important for academic administrators to keep in mind that although fewer students enroll in occupational/technical programs than enroll in college transfer programs, more occupational/technical students graduate.

TABLE 3: NUMBER OF PVCC GRADUATES BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	1985-1986 No.	1985-1986 Pct.	1985-1986 Meets SCHEV Standard	1986-1987 No.	1986-1987 Pct.	1986-1987 Meets SCHEV Standard	1987-1988 No.	1987-1988 Pct.	1987-1988 Meets SCHEV Standard	AVERAGE No.	AVERAGE Pct.	AVERAGE Meets SCHEV Standard
Arts & Crafts (Cert.)	0	0.0%	N/A	3	1.9%	N/A	0	0.0%	N/A	1	0.6%	N/A
BUSINESS & MANAGEMENT			Yes			Yes			Yes			Yes
Accounting (AAS)	12	6.9%		6	3.8%		3	2.1%		7	4.4%	
Management (AAS)	16	9.2%		9	5.7%		18	12.7%		14	9.1%	
Marketing (AAS)	3	1.7%		2	1.3%		5	3.5%		3	2.1%	
BUSINESS & OFFICE												
Office Systems (AAS)	4	2.3%	No	6	3.8%	No	7	4.9%	Yes	6	3.6%	No
Clerical Studies (Cert.)	1	0.6%		3	1.9%		3	2.1%		2	1.5%	
Computer Systems (AAS)	18	10.3%	Yes	7	4.5%	Yes	9	6.3%	Yes	11	7.2%	Yes
ELECTRONICS												
Electronics (AAS)	10	5.7%	Yes	8	5.1%	Yes	7	4.9%	Yes	8	5.3%	Yes
Electronics (Cert.)	0	0.0%		3	1.9%		1	0.7%		1	0.8%	
Health Technology (Cert.)	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A
MECHANICAL TECHNOLOGY												
Drafting & Design (AAS)	0	0.0%	No	9	5.7%	Yes	3	2.1%	No	4	2.5%	No
Drafting (Cert.)	0	0.0%		3	1.9%		0	0.0%		1	0.6%	
Drafting Design (Diploma)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Nursing (AAS)	42	24.1%	Yes	39	24.8%	Yes	42	29.6%	Yes	41	26.0%	Yes
POLICE SCIENCE												
Police Science (AAS)	5	2.9%	No	9	5.7%	Yes	0	0.0%	No	5	3.0%	No
Law Enforcement (Cert.)	1	0.6%		1	0.6%		0	0.0%		1	0.4%	
Respiratory Therapy (AAS)	11	6.3%	Yes	9	5.7%	Yes	3	2.1%	No	8	4.9%	Yes
Science Laboratory (AAS)	--	--	--	1	0.6%	No	0	0.0%	No	1	0.3%	No
CAREER STUDIES CERTIFICATE	51	29.3%	N/A	39	24.8%	N/A	41	28.9%	N/A	44	27.7%	N/A
TOTAL	174	71.3%		157	66.0%		142	61.5%		158	66.4%	

SOURCE: VCCS Graduation Awards Conferred Booklet. Percentages are by column except for the final row which is the percentage of occupational/technical graduates among all graduates. SCHEV "productivity standards require that programs have an average of . . . 7 or more A.A.S. degrees . . . annually" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). SCHEV does not set productivity standards for certificates or diplomas.

As noted earlier, SCHEV has set numerical standards not only for FTES enrollment in occupational/technical programs but also for program completion. Each program leading toward an AAS degree should produce an average of seven graduates per year. Table 3 presents PVCC occupational/technical graduates during the past three years and indicates whether the programs met the SCHEV standard during that time.

As can be seen, five of the nine AAS programs met the SCHEV graduation standard. By far the most productive program was Nursing, producing an average of 41 graduates per year. Next was Business and Management with an average of 24 graduates per year. Following these were Computer Information Systems with 11 graduates, Electronics with 8 graduates, and Respiratory Therapy with 8 graduates. Although Respiratory Therapy averaged eight graduates during the three-year period, only three students graduated in Respiratory Therapy during 1987-1988.

Unproductive programs, according to SCHEV standards, were Office Systems Technology (6 graduates), Police Science (5 graduates), Drafting and Design (4 graduates), and Science Laboratory Technology (1 graduate). Both Drafting and Design and Police Science produced more than seven graduates during 1986-1987, and Office Systems Technology produced seven graduates during 1987-1988. Science Laboratory Technology has never produced more than one graduate per year.

The three certificate programs typically produce one or two graduates per year. The three-year average number of graduates for Arts and Crafts was one, for Clerical

Studies two, and for Law Enforcement one. During the three-year period, an average of 44 career studies certificates were awarded each year.

OCCUPATIONAL GROWTH AND DEMAND

Occupational/technical programs in a community college can only be successful if they meet community needs. Programs designed to provide workers for occupations requiring few workers or having little growth potential should not be offered. For this reason, occupational/technical programs should be periodically reviewed to ensure they are meeting community needs. This section attempts to provide a limited review of occupational growth and demand with respect to PVCC occupational/technical programs. Career studies certificate programs are not included in this section because they are intended for workers already employed in career fields.

Table 4 presents the occupational growth rate for each *VODSWI* occupation for which one of PVCC's AAS or certificate programs prepares workers. Occupational growth is expressed as the percentage of change between 1984 and 1995 and is shown for both SDA 7 and the state of Virginia as a whole.

TABLE 4: OCCUPATIONAL GROWTH BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM (1988-1989)

ACADEMIC PROGRAM	RELATED OCCUPATION	Percent Change 1984 to 1995 SDA 7	Percent Change 1984 to 1995 Virginia
Arts & Crafts (Cert.)	Commercial Artist	32.8%	60.6%
	Designer	30.5%	39.8%
	Photographer	26.9%	47.5%
	Cabinetmaker	27.3%	17.5%
BUSINESS & MANAGEMENT			
Accounting (AAS)	Accountant/Auditor	36.6%	38.4%
Management (AAS)	Managers (Business)	25.2%	29.1%
	Managers (Sales)	28.8%	26.7%
	Managers (Store)	30.0%	36.1%
	Sales Clerk Supervisors	25.6%	33.1%
	Other Sales Workers	31.4%	32.6%
	Bank Teller/Collector/etc.	24.1%	29.8%
Marketing (AAS)	Public Relations	27.1%	29.8%
BUSINESS & OFFICE			
Office Systems (AAS)	Clerical Supervisor	27.1%	39.1%
Clerical Studies (Cert.)	Secretaries	16.2%	19.9%
	Stenographers	0.2%	-20.6%
	Typists	13.2%	10.4%
	Clerical Worker	25.0%	26.2%
	Receptionist	23.3%	39.3%
	Switchboard/Telephone Oper.	22.8%	32.3%
Computer Systems (AAS)	Computer Programmer	36.7%	64.7%
	Computer Operator	34.1%	47.2%
	Data Entry Operator	-1.4%	3.3%
ELECTRONICS			
Electronics (AAS)	Electronics Technician	44.3%	44.7%
Electronics (Cert.)	Electrician	26.3%	24.8%
Health Technology (Cert.)	Medical Assistant	41.3%	64.0%
	Nursing/Psychiatric Aide	19.1%	32.2%
	X-Ray/Radiologic Technician	28.4%	43.9%
	Medical Records Librarian	NA	38.7%
MECHANICAL TECHNOLOGY			
Drafting & Design (AAS)	Drafter	10.9%	16.2%
Drafting (Cert.)			
Drafting Design (Diploma)			
Nursing (AAS)	Registered Nurse	44.5%	59.8%
	Licensed Practical Nurse	16.1%	32.1%
POLICE SCIENCE			
Police Science (AAS)	Police/Sheriff	29.2%	23.0%
Law Enforcement (Cert.)	Corrections Officer	48.6%	35.4%
	Private Guard	23.8%	59.3%
Respiratory Therapy (AAS)	Inhalation Therapist	29.7%	46.5%
Science Laboratory (AAS)	Clinical Lab Technician	14.9%	31.8%

SOURCE: Julia H. Martin et al., Virginia Occupational Demand, Supply and Wage Information, Service Delivery Area 7, 7th edition (Charlottesville: Virginia Occupational Information Coordinating Committee, Center for Public Service, December 1988).

The occupations for which PVCC occupational/technical programs prepare workers generally exceed the projected state growth rate for all occupations, which is 29%. Although some of the occupations listed for PVCC occupational/technical programs, such as stenographer or data entry operator, have low growth potential, other occupations for the same programs have quite high growth potential, and the high growth rate more than cancels out the low growth rate. The only occupational/technical program for which this is not true is Mechanical Technology, and the low growth rate for drafters is somewhat misleading. Although "growth in this occupation is expected to be limited to about half the growth rate for all occupations," an "increased use of computer-aided design (CAD) systems" will occur, and PVCC's program in Mechanical Technology is designed to prepared CAD system drafters.[6]

Table 5 presents occupational demand for each *VODSWI* occupation for which one of PVCC's AAS or certificate programs prepares workers. Occupational demand is expressed in this table as the average number of annual job openings for both SDA 7 and the state of Virginia. The average annual job openings listed in Table 6 are conservative estimates. In this study, average annual job openings are defined as

> . . . the expected annual number of openings resulting from the creation of new jobs or from vacancies left by people exiting from the labor force. Average annual job openings do *not* include openings that result from job turnover, occupational mobility, or geographic mobility. Consequently the total number of openings occurring each year will be greater than the average annual openings shown.[7]

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[6]*VODSWI*, p. 106.

[7]*VODSWI*, p. xvi.

TABLE 5: OCCUPATIONAL DEMAND BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM (1988-1989)

ACADEMIC PROGRAM	RELATED OCCUPATION	Average Annual Job Openings SDA 7	Average Annual Job Openings Virginia
Arts & Crafts (Cert.)	Commercial Artist	4	212
	Designer	7	211
	Photographer	2	65
	Cabinetmaker	6	90
BUSINESS & MANAGEMENT			
Accounting (AAS)	Accountant/Auditor	57	1,156
Management (AAS)	Managers (Business)	403	10,519
	Managers (Sales)	8	257
	Managers (Store)	73	2,060
	Sales Clerk Supervisors	3	93
	Other Sales Workers	164	5,163
	Bank Teller/Collector/etc.	39	1,128
Marketing (AAS)	Public Relations	3	129
BUSINESS & OFFICE			
Office Systems (AAS)	Clerical Supervisor	31	790
Clerical Studies (Cert.)	Secretaries	149	3,865
	Stenographers	22	137
	Typists	74	1,475
	Clerical Worker	208	5,753
	Receptionist	26	834
	Switchboard/Telephone Oper.	36	867
Computer Systems (AAS)	Computer Programmer	16	875
	Computer Operator	12	382
	Data Entry Operator	8	279
ELECTRONICS			
Electronics (AAS)	Electronics Technician	23	618
Electronics (Cert.)	Electrician	28	717
Health Technology (Cert.)	Medical Assistant	5	194
	Nursing/Psychiatric Aide	85	2,238
	X-Ray/Radiologic Technician	6	160
	Medical Records Librarian	NA	40
MECHANICAL TECHNOLOGY			
Drafting & Design (AAS)	Drafter	6	237
Drafting (Cert.)			
Drafting Design (Diploma)			
Nursing (AAS)	Registered Nurse	110	2,801
	Licensed Practical Nurse	35	928
POLICE SCIENCE			
Police Science (AAS)	Police/Sheriff	21	530
Law Enforcement (Cert.)	Corrections Officer	23	535
	Private Guard	63	2,281
Respiratory Therapy (AAS)	Inhalation Therapist	2	56
Science Laboratory (AAS)	Clinical Lab Technician	10	337

SOURCE: Julia H. Martin et al., Virginia Occupational Demand, Supply and Wage Information, Service Delivery Area 7, 7th edition (Charlottesville: Virginia Occupational Information Coordinating Committee, Center for Public Service, December 1988).

Occupational demand within SDA 7 for the occupations listed in Table 5 ranges from 2 to more than 400. The programs with the lowest occupational demand are the certificate program in Arts and Crafts and the AAS program in Respiratory Therapy. The two programs with the highest occupational demand are the program in Business and Management and the program in Business and Office.

The occupational demand figures presented in Table 5 are only meaningful when placed in context with PVCC occupational/technical program enrollment and completion figures. Table 6 lists both the number of PVCC graduates and the number of PVCC fall term students for each SDA 7 job openings. The lower the number, the higher the demand for PVCC occupational/technical students and graduates. In Arts and Crafts, for instance,

TABLE 6: OCCUPATIONAL DEMAND FOR PVCC OCCUPATIONAL/TECHNICAL PROGRAM GRADUATES AND STUDENTS (1988-1989)

ACADEMIC PROGRAM	No. PVCC Graduates for each SDA 7 Job Opening	No. PVCC Students for each SDA 7 Job Opening
Arts & Crafts (Cert.)	0.1	0.2
BUSINESS & MANAGEMENT		
Accounting (AAS)	0.1	1.1
Management (AAS)	0.0	0.2
Marketing (AAS)	1.1	7.9
BUSINESS & OFFICE Office Systems (AAS) Clerical Studies (Cert.)	0.0	0.3
Computer Systems (AAS)	0.3	3.1
ELECTRONICS Electronics (AAS) Electronics (Cert.)	0.2	1.3
Health Technology (Cert.)	0.0	0.1
MECHANICAL TECHNOLOGY Drafting & Design (AAS) Drafting (Cert.) Drafting Design (Diploma)	0.8	6.0
Nursing (AAS)	0.3	0.9
POLICE SCIENCE Police Science (AAS) Law Enforcement (Cert.)	0.0	0.4
Respiratory Therapy (AAS)	3.8	7.3
Science Laboratory (AAS)	0.1	0.6

NOTE: The number of PVCC graduates and students available for each SDA 7 job opening is calculated by dividing the three year average number of graduates or students (see Tables 1-2) by the average annual job openings (see Table 6).

there are more than ten jobs for each PVCC graduate and more than five jobs for each fall term student; in Respiratory Therapy, however, nearly four graduates and more than seven fall term students must compete for each job opening.

There does not seem to be an over supply of PVCC graduates in most occupational/technical programs. In fact, the demand for PVCC graduates in programs such as Business and Office or Police Science appears to be quite high within the PVCC service region. The one major exception is the AAS program in Respiratory Therapy. As noted above, for every job opening in Respiratory Therapy, there are nearly four PVCC graduates in Respiratory Therapy and more than seven PVCC fall term students.

It should be noted, however, that Respiratory Therapy is a regional program which has been able to find jobs in Respiratory Therapy for most of its graduates. In this respect, the *VODSWI* occupational demand figures for Respiratory Therapy are misleading. Still, the college might wish to conduct a local needs assessment in Respiratory Therapy to verify that jobs are indeed available for graduates.

CONCLUSIONS

Occupational/technical students typically make up approximately one-third of all curricular students and FTES enrolled at PVCC. Of these occupational/technical students, nearly one-third are enrolled in the Business and Management program. The next largest programs in terms of student enrollment are Nursing and Computer Information Systems. The two smallest programs are Arts and Crafts Production and

Science Laboratory Technology. In terms of completion, however, approximately two-thirds of all graduates receive degrees or awards in occupational/technical areas. Occupational/technical students, in other words, are much more likely to complete their degrees or award programs than are college transfer students.

Measuring AAS programs during a three-year average period against SCHEV productivity standards, two programs, Drafting and Design and Science Laboratory Technology, met neither FTES enrollment nor graduation standards; one program, Respiratory Therapy, met graduation standards but not FTES enrollment standards; and two programs, Office Systems Technology and Police Science, met FTES enrollment standards but not graduation standards.

Generally, the growth rates for occupations for which PVCC occupational/technical programs prepare workers are quite high. The only exception to this is the Mechanical Technology program, but occupational growth rates do not take into account the rise of CAD systems. Similarly, there seem to be ample job opportunities in occupations for which PVCC occupational/technical programs prepare workers. The only exception is the Respiratory Therapy program in which there appears to be more graduates than jobs.

RECOMMENDATIONS

Three recommendations emerge from this study. First, as mentioned in the introduction, efforts must be intensified to ensure that students are correctly coded in the VCCS database with respect to the curriculum in which they are enrolled. Already steps have been taken by A&R to ensure that correct curricular codes are entered during registration and throughout an academic term. Not only should the procedures adopted by A&R to accomplish this be evaluated periodically, but A&R should attempt to correct the curricular codes of students already in the student database.

It is unfair to expect A&R to update all student curricular codes without the assistance of the administration and faculty. It is recommended that one academic administrator or faculty member from each degree or certificate program review each semester a list of all students within that program and send additions, deletions, or corrections to A&R. The list itself can be generated from the Office of Administrative Computing.

A second recommendation is that a community needs assessment be conducted in the near future. A thorough community needs assessment has not been conducted at PVCC in the 1980's, and it is difficult to know whether in fact the college is meeting all of the needs of its service region. A community needs survey would help resolve some of the questions raised in this study. For example, a community needs survey would indicate whether in fact there are more PVCC graduates than jobs in Respiratory

Therapy. It would also indicate whether the demand for CAD trained drafters will be high within the PVCC service region.

Although the Office of Institutional Research and Planning should play a major role in a community needs assessment, the task should include as many groups and members of the college community as possible. At least one academic administrator or faculty member from each degree or certificate program should be designated to collect data concerning that program.

The final recommendation is that the entire academic program review process be re-examined. Although the process has resulted in a great deal of valuable information, it has not provided other information that may be crucial in making sound decisions. Part of the problem is that the review process concentrates on single programs rather than the entire curriculum. For instance, by concentrating only on single programs, the review process has neglected the problem of coding students in curricula no longer offered at PVCC. A more systematic academic program review process is probably needed.

Perhaps this study should be conducted every three years, or even annually. Perhaps some of the measures used in this study should be used in the academic program review process. Perhaps additional measures are needed. Certainly, the process can only be improved and strengthened by a thorough re-examination.

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